FORM PTO-1390 (Modified) (REV 11-98) U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US) CONCERNING A FILING UNDER 35 U.S.C. 371

ATTORNEY'S DOCKET NUMBER	
201433US2PCT	
U S APPLICATION NO (IF KNOWN, SEE 37 CFR	
09/720809	

INTERNATIONAL APPLICATION NO.	INTERNATIONAL FILING DATE	PRIORITY DATE CLAIMED
PCT/SE99/01213	02 JULY 1999	03 JULY 1998

TITLE OF INVENTION

MOBILE TELECOMMUNICATION SYSTEM

APPLICANT(S) FOR DO/EO/US

Per-Goran ANDERMO, et al.

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This is an express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39(1).
4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
5. ☒ A copy of the International Application as filed (35 U.S.C. 371 (c) (2))
   a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☒ has been transmitted by the International Bureau.
   c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☐ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
7. ☒ A copy of the International Search Report (PCT/ISA/210).
8. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371 (c)(3))
   a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
   b. ☐ have been transmitted by the International Bureau.
   c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
   d. ☒ have not been made and will not be made.
9. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
10. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371 (c)(4)).
11. ☐ A copy of the International Preliminary Examination Report (PCT/IPEA/409).
12. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371 (c)(5)).

Items 13 to 20 below concern document(s) or information included:

13. ☐ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
14. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
15. ☐ A **FIRST** preliminary amendment.
16. ☐ A **SECOND** or **SUBSEQUENT** preliminary amendment.
17. ☐ A substitute specification.
18. ☐ A change of power of attorney and/or address letter.
19. ☐ Certificate of Mailing by Express Mail
20. ☒ Other items or information:

Request for Consideration of Documents Cited in International Search Report
Notice of Priority

U.S. APPLICATION NO. (IF KNOWN, SEE 37 CFR)	INTERNATIONAL APPLICATION NO.	ATTORNEY'S DOCKET NUMBER
09/720809	PCT/SE99/01213	201433US2PCT

21. The following fees are submitted:.

BASIC NATIONAL FEE (37 CFR 1.492 (a) (1) - (5)) :

		CALCULATIONS PTO USE ONLY
☒	Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2) paid to USPTO and International Search Report not prepared by the EPO or JPO	$1,000.00
☐	International preliminary examination fee (37 CFR 1.482) not paid to USPTO but Internation Search Report prepared by the EPO or JPO	$860.00
☐	International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO	$710.00
☐	International preliminary examination fee paid to USPTO (37 CFR 1.482) but all claims did not satisfy provisions of PCT Article 33(1)-(4)	$690.00
☐	International preliminary examination fee paid to USPTO (37 CFR 1.482) and all claims satisfied provisions of PCT Article 33(1)-(4)	$100.00

ENTER APPROPRIATE BASIC FEE AMOUNT = $1,000.00

Surcharge of **$130.00** for furnishing the oath or declaration later than ☐ 20 ☒ 30 months from the earliest claimed priority date (37 CFR 1.492 (e)). $130.00

CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	
Total claims	- 20 =	0	x $18.00	$0.00
Independent claims	- 3 =	0	x $80.00	$0.00
Multiple Dependent Claims **(check if applicable).**			☐	$0.00

TOTAL OF ABOVE CALCULATIONS = $1,130.00

Reduction of 1/2 for filing by small entity, if applicable. Verified Small Entity Statement must also be filed (Note 37 CFR 1.9, 1.27, 1.28) **(check if applicable).** ☐ $0.00

SUBTOTAL = $1,130.00

Processing fee of **$130.00** for furnishing the English translation later than ☐ 20 ☐ 30 months from the earliest claimed priority date (37 CFR 1.492 (f)). + $0.00

TOTAL NATIONAL FEE = $1,130.00

Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31) **(check if applicable).** ☐ $0.00

TOTAL FEES ENCLOSED = $1,130.00

Amount to be: refunded	$
charged	$

☒ A check in the amount of **$1,130.00** to cover the above fees is enclosed.

☐ Please charge my Deposit Account No. in the amount of to cover the above fees.
A duplicate copy of this sheet is enclosed.

☒ The Commissioner is hereby authorized to charge any fees which may be required, or credit any overpayment to Deposit Account No. **15-0030** A duplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

SEND ALL CORRESPONDENCE TO:

22850

(703) 413-3000

Surinder Sachar
Registration No. 34,423

Surinder Sachar
SIGNATURE

Marvin J. Spivak
NAME

24,913
REGISTRATION NUMBER

1-3-01
DATE

201433US2PCT

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :

PER-GOERAN ANDERMO ET AL : ATTN: APPLICATION DIVISION

SERIAL NO: 09/720,809 :

FILED: JANUARY 3, 2001 :

FOR: MOBILE TELECOMMUNICATION: SYSTEM

PRELIMINARY AMENDMENT

ASSISTANT COMMISSIONER FOR PATENTS
WASHINGTON, D.C. 20231

SIR:

Prior to a first examination on the merits, please amend the above-identified application as follows:

IN THE CLAIMS

Please amend the claims as follows:

Claim 3, line 1, replace "claims 1 or 2" with --claim 1--.

Claim 6, line 1, replace "anyone of the preceding claims" with --claim 1--.

Claim 7, line 1, replace "anyone of the preceding claims" with --claim 1--.

Claim 12, line 1, delete "10 or 11,".

Claim 13, line 1, replace "any one of claims 9 - 12" with --claim 9--.

Claim 16, line 1, replace "any one of claims 9 - 15" with --claim 9--.

Claim 19, line 1, delete "or 18".

Claim 21, line 1, replace "claims 19 or 20" with --claim 19--.

REMARKS

Favorable consideration of this application, as presently amended, is respectfully requested.

The present preliminary amendment is submitted to place the above-identified application in more proper format under United States practice. By the present preliminary amendment the claims have been amended to no longer recite any multiple dependencies.

The present application is believed to be in condition for a full and thorough examination on the merits. An early and favorable consideration of the present application is hereby respectfully requested.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.

Gregory J. Maier
Attorney of Record
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DOCKET NO: 201433US2PCT

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF:
PER-GORAN ANDERMO ET AL

SERIAL NO: 09/720,809

FILED: 03 JANUARY 2001

FOR: MOBILE TELECOMMUNICATION: SYSTEM

LETTER REGARDING CLAIM TO SMALL ENTITY STATUS

ASSISTANT COMMISSIONER FOR PATENTS
WASHINGTON, D.C. 20231

SIR:

Applicant(s) hereby give notice that Small Entity Status is claimed in the above-identified application.

Further, it is requested that the additional fees paid upon filing the subject application be refunded to Deposit Account 15-0030. A duplicate copy of this sheet is enclosed.

Our check in the amount of $ - 0 - is attached hereto. If any variance exists between the amount enclosed, please charge or credit the difference to our Deposit Account No. 15-0030. A duplicate copy of this sheet is enclosed.

Respectfully submitted,

OBLON, SPIVAK, McCLELLAND,
MAIER & NEUSTADT, P.C.

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MOBILE TELECOMMUNICATION SYSTEM

Field of the invention

The present invention relates to a method and an arrangement in a mobile telecommunication system using lobes for establishing and maintaining a radio channel between a mobile station (MS) and a base station (BS).

Background of the invention

In a cellular system with a phased array antenna system narrow lobes are generated by a lobe shaping unit (LSU). These narrow lobes are directed towards mobile stations.

At call set up the direction of a mobile station within a sector is unknown. Narrow lobes cannot be established until the direction is known. The invention gives a solution on how to find both the initial direction of the mobile terminal and to detect the initial signalling. An algorithm is also described how to change from a wide lobe to a narrow lobe during call set up.

A similar problem exists when a handover is carried out between sectors or base sites.

A similar method is used for signal strength measurements.

Summary of the invention

Thus, the object of the invention is to find the initial direction of a mobile terminal, detect the initial signalling, establish and maintain a connection between the base station and the mobile station.

This object is achieved by means of a method and an arrangement according to claims 1 and 9, respectively.

Other characteristics of the invention are set out in the dependent claims.

Brief description of the drawing

A preferred embodiment of the invention will now be given below with reference to the only drawing:

Figure 1 discloses the construction of the lobe shaping system including the Direction Finding Unit according to the invention.

Detailed description of an embodiment of the invention

In the following description certain abbreviations are used throughout the text. First these abbreviations will be explained, after which the invention will be described with reference to Figure 1.

DFU	Direction Finding Unit
MS	Mobile Station
MTX	Mobile Telephone Exchange
BSC	Base Site Controller for control of LSU and DFU
BS	Base Station
TRX	Transceiver Equipment (Transmitter/Receiver Equipment)
CC	Calling Channel
TCfree	free Traffic Channel
TCho	Traffic Channel receiving handover from another channel
RSS	Radio Signal Strength
RSSI	Radio Signal Strength Indicator
LSU	Lobe Shaping Unit
SSM	Signal Strength Measurement
SR	Signal Strength Receiver or TRX used for signal strength measurements

In addition to conventional equipment as for example transmitter/receiver equipment (TRX), antenna means, control means for establishing channels, means for measuring signal strength connected to supervising means for handover decisions, the base station (BS) of the present invention also includes a Direction Finding Unit (DFU) and lobe shaping units (LSU). The RSSI-records, RSSI and fast scanning switch of figure 1 constitute the DFU. The MTX constitutes the interface to the fixed public or private network, e.g. POTS, ISDN. The MTX is considered to be the most complex part of the mobile communication system, and all final decisions regarding handover, roaming, call set up etc. emanates from the MTX. The TRX is connected to a lobe shaping unit (LSU) which in turn is connected to an antenna array. The lobe shaping unit (LSU) is arranged to form lobes with different widths and gains in arbitrary directions in both uplink and downlink by altering phase- and amplitude coefficients. The lobe shaping unit is described in detail in pending patent applications, assigned to Radio Design Innovation TJ AB, which applications are incorporated herein by reference.

Now, returning to the DFU its responsibility resides in the localisation of a mobile station (MS) as fast as possible in order to avoid that the signalling between the MTX and the MS is lost. This function is particularly required during a call set-up or in handover situations when the position of the MS initially is unknown to the BSC. The above localisation is achieved by allocating narrow antenna lobes (using LSU and an antenna array) covering the whole area inside a sector. The DFU simultaneously or preferably sequentially scans all receiving lobes. Upon detection of received signal strength in one or a multitude of the receiving lobes the

lobe with highest signal strength is selected and the BSC establishes a configured lobe in the direction of the selected lobe for communication between the MS and a TRX. It should of course be realised that the MS, before sending signals to the BS, must identify the BS. This is achieved by the BS transmitting identification signals in a wide lobe in order to inform MS, covered by said wide lobe, about its existence.

A function procedure scheme for the DFU is described below.

1. Upon receiving a CC, TCfree or TCho activation order (MTX sends order to a TRX-unit), the BSC activates the DFU. A wide lobe in the LSU is connected to the transmitter for the down link contact (paging) with the mobile station MS. The DFU is set to correct channel number and monitors the received signal in the uplink in narrow lobes.

2. The MS activates its transmitter as response to the paging to set up a MS initiated call on a new frequency after e.g. a handover order. Power starts to ramp up and before frame data is transmitted, the DFU must have identified the lobe with strongest RF-level. By scanning through the narrow lobes, the DFU will find the lobe with the strongest received signal strength. This narrow lobe is selected. The BSC sets up a path through the equipment with the selected lobe connected to the receiver.

3. During the reception of NMT-frames the DFU measures RSS and keeps a record of each lobe. The BSC reads the RSSI records from the DFU and connects continuously the best lobe to the receiver.

4. At a suitable point in the signalling scheme the BSC reads the RSSI record from the DFU and decides which lobe is best to use for transmitter part and connects the best lobe in that direction to the transmitter, i.e. the down-link wide lobe is transformed into a narrow lobe.

5. During the signalling and speech conversion, the DFU measures RSSI and the BSC continuously connects the best lobe to receiver and transmitter.

In other words, the mobile station is paged using a wide lobe in the down link, but the base station listens in the up link using narrow lobes scanned through possible directions. By narrowing the up-link lobe from e.g. 60° to 10-18°, typically 15°, the antenna gain in the base station increases a factor of approx. 4-5 (6-7 dB). This means that the output power of the mobile station may be lowered accordingly which is a great advantage because of the limited battery power available. On the other hand, the base station may transmit in the down link with

sufficient power in a wide lobe during call set-up or handover etc.,since the base station is not so sensitive with respect to the power consumption.

A similar method as above is used for signal strength measurements. The responsibility for the SSM function is to connect a SR unit (or channel unit) to the best lobe so that signal strength measurements can be performed by the SR unit, on the best lobe. The RSSI measurements are initiated from the MTX.

The SSM function uses the same hardware configuration as the DFU function.

A function scheme for the SSM function is described below.

1. Upon receiving a measurement activation order (MTX sends order to a TRX or SR unit), the BSC activates the DFU and the DFU is set to correct channel number and monitors the received signal.

2. The DFU identifies the lobe with the strongest RF-level. The BSC sets up a path through the equipment with the selected lobe connected to the SR.

3. SR performs RSSI and Φ tone measurements. In for example Nordic Mobile Telephone (NMT) quality of a call is controlled by a control signal (Φ tone) i.e. one of four tones around 4kHz. The base station transmits the Φ signal to the mobile station which returns the signal to the base station. The quality of the returned Φ signal is measured in the base station and if the quality is below a predetermined value the base station transmits an alarm to an MTX. Then, the MTX orders the base station and surrounding base stations to measure the strength of the radio signal from the mobile station. The base stations send the measurement results to the MTX, after which the MTX connects the call to the base station with highest received signal strength.

4. The DFU monitors the received signal and the BSC continuously connects the best lobe to the SR. After the RX is ready BSC disconnects SR equipment.

It would be appreciated by those of ordinary skill in the art that the present invention can be embodied in other specific forms without departing from the spirit or essential character thereof. The presently disclosed embodiments are therefore considered in all respects to be illustrative and not restrictive. The scope of the inventions indicated by the appended claims rather than the foregoing description, and all changes which come within the meaning and range of equivalence thereof are intended to be embraced therein.

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CLAIMS

1. A method in a mobile telecommunication system using lobes for establishing a radio channel between a mobile station (MS) and a base station (BS), characterized by the steps of:

connecting the transmitter of the base station to a wide lobe in a sector;

connecting the receiver of the base station to narrow lobes in the sector through a fast scanning switch;

measuring the signal strength (RSS) received from the mobile station or signal quality in each lobe in the sector during the increase of the power in the mobile station in the beginning of the frame;

selecting the lobe with highest received signal strength (RSS) or signal quality;

connecting the receiver equipment of the base station (BS) to the selected narrow lobe before frame data starts to be transmitted; and

connecting the transmitter equipment of the base station (BS) from a wide to narrow lobe at a suitable point in the signalling scheme.

2. A method as claimed in claim 1, characterized in that the base station (BS) measures the received signal strength (RSS) or signal quality of the lobes in the sector simultaneously or sequentially.

3. A method as claimed in claims 1 or 2, characterized in that a direction finding unit (DFU) in the base station (BS) measures the received signal strength (RSS) or signal quality in each lobe in the sector, and stores the values of the received signal strength or signal quality for each lobe in a memory (RSSI-records).

4. A method as claimed in claim 3, characterized in that a base site controller (BSC) reads the values in the memory (RSSI-records) and decides which lobe has the highest received signal strength or signal quality selecting that lobe direction for communication with the mobile station.

5. A method as claimed in claim 4, characterized in that the base site controller (BSC) configures a lobe shaping unit (LSU) to establish a preferable lobe, e.g. narrower lobe, in the direction of the selected lobe towards the mobile station for the downlink and/or uplink respectively.

6. A method as claimed in anyone of the preceding claims, characterized in that it is used at call set up and/or at handover between sectors.

7. A method as claimed in anyone of the preceding claims, characterized in that lobes having different widths and gains in arbitrary directions both in the uplink and the downlink are formed by changing phase and amplitude coefficients.

8. A method as claimed in claim 7, characterized in that the base station (BS) transmits identification signals in a wide lobe to inform the mobile station (MS), which is covered by said wide lobe, about its existence.

9. A method in a mobile telecommunication system using lobes for measuring the signal quality of a radio channel between a mobile station (MS) and a base station (BS), **characterized** by the steps of:

connecting the receiver of the base station to narrow lobes in the sector through a fast scanning switch;

measuring the signal strength (RSS) received from the mobile station or signal quality in each narrow lobe in the sector;

selecting the lobe with highest received signal strength (RSS) or signal quality;

connecting a signal quality receiver unit (SR) to the selected narrow lobe.

10. A method as claimed in claim 9, **characterized** in that the signal quality receiver unit (SR) performs signal strength measurements or Φ tone measurements in this selected lobe for handover purposes.

11. A method as claimed in claim 10, **characterized** in that the base station (BS) monitors the received signal and continuously connects the best lobe to the signal quality receiver unit (SR).

12. A method as claimed in claim 9, 10 or 11, **characterized** in that the base station (BS) measures the received signal strength (RSS) or signal quality of narrow lobes in the sector simultaneously or sequentially.

13. A method as claimed in any one of claims 9 - 12, **characterized** in that a direction finding unit (DFU) in the base station (BS) measures the received signal strength (RSS) or signal quality in each lobe in the sector, and stores the values of the received signal strength or signal quality for each lobe in a memory (RSSI-records).

14. A method as claimed in claim 13, **characterized** in that a base site controller (BSC) reads the values in the memory (RSSI-records) and decides which lobe has the highest received signal strength or signal quality selecting that lobe direction for communication with the mobile station.

15. A method as claimed in claim 14, **characterized** in that the base site controller (BSC) configures a lobe shaping unit (LSU) to establish a preferable lobe, e.g. narrower lobe, in the direction of the selected lobe towards the mobile station for the downlink and/or uplink respectively.

16. A method as claimed in any one of claims 9 - 15, **characterized** in that lobes having different widths and gains in arbitrary directions both in the uplink and the downlink are formed by changing phase and amplitude coefficients.

17. An arrangement in a mobile telecommunication system using lobes for establishing a radio channel between a mobile station (MS) and a base station (BS), **characterized** in that a lobe shaping unit is arranged to connect the transmitter of the base station to a wide lobe in a sector and to connect the receiver of the base

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station to narrow lobes in the sector through a fast scanning switch, in that a direction finding unit (DFU) in the base station (BS) is arranged to measure the signal strength (RSS) received from the mobile station or signal quality in each lobe in the sector during the increase of the power in the mobile station, to select the lobe with highest received signal strength (RSS) or signal quality, to connect the receiver part of an arbitrary TRX-equipment of the base station (BS) to the selected narrow lobe before frame data starts to be transmitted and to connect the transmitter part of an arbitrary TRX-equipment of the base station (BS) from a wide lobe to the narrow lobe using the selected narrow lobe at a suitable point in the signalling scheme.

18. An arrangement in a mobile telecommunication system using lobes for measuring the signal quality of a radio channel between a mobile station (MS) and a base station (BS), characterized in that a lobe shaping unit is arranged to connect the receiver of the base station to narrow lobes in the sector through a fast scanning switch, in that a direction finding unit (DFU) in the base station (BS) is arranged to measure the signal strength (RSS) received from the mobile station or signal quality in each lobe in the sector, to select the lobe with highest received signal strength (RSS) or signal quality, and to connect a signal quality receiver unit (SR) to the selected narrow lobe.

19. An arrangement as claimed in claim 17 or 18, characterized in that the direction finding unit includes a RSSI-record, RSSI-unit and said fast scanning switch.

20. An arrangement as claimed in claim 19, characterized in that the DFU reads RSSI and keeps a RSSI-record for each lobe.

21. An arrangement as claimed in claims 19 or 20, characterized in that the base station controller (BSC) reads the RSSI-record of the direction finding unit (DFU) and continuously connects the best lobe to the receiver.

PCT/SE99/01213

03 -09- 1999

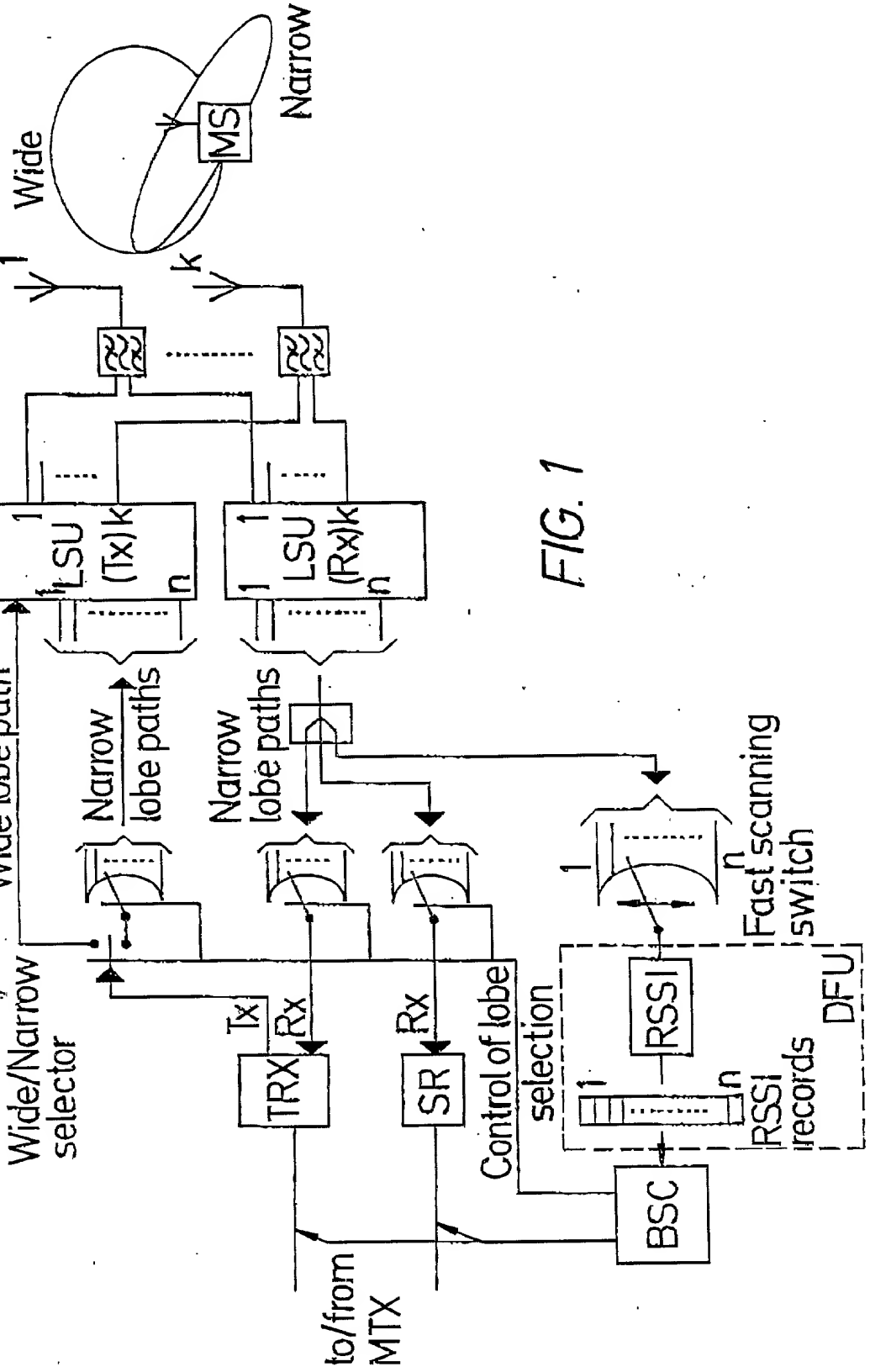

FIG. 1

201433US2PCT

Declaration, Power Of Attorney and Petition

WE (I) the undersigned inventor(s), hereby declare(s) that:

My residence, post office address and citizenship are as stated below next to my name,

We (I) believe that we are (I am) the original, first, and joint (sole) inventor(s) of the subject matter which is claimed and for which a patent is sought on the invention entitled

MOBILE TELECOMMUNICATION SYSTEM

the specification of which

☐ is attached hereto.

☒ was filed on 03 JANUARY 2001 as

Application Serial No. 09/720,809

and amended on _____.

☒ was filed as PCT international application

Number PCT/SE99/01213

on 02 JULY 1999,

and was amended under PCT Article 19

on _____ (if applicable).

We (I) hereby state that we (I) have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

We (I) acknowledge the duty to disclose information known to be material to the patentability of this application as defined in Section 1.56 of Title 37 Code of Federal Regulations.

We (I) hereby claim foreign priority benefits under 35 U.S.C. § 119(a)-(d) or § 365(b) of any foreign application(s) for patent or inventor's certificate, or § 365(a) of any PCT International application which designated at least one country other than the United States, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or PCT International application having a filing date before that of the application on which priority is claimed. Prior Foreign Application(s)

Application No.	Country	Day/Month/Year	Priority Claimed
9802387-2	SWEDEN	03 JULY 1998	☒ Yes ☐ No
			☐ Yes ☐ No
			☐ Yes ☐ No
			☐ Yes ☐ No

We (I) hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below.

(Application Number)	(Filing Date)
(Application Number)	(Filing Date)

We (I) hereby claim the benefit under 35 U.S.C. § 120 of any United States application(s), or § 365(c) of any PCT International application designating the United States, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT International application in the manner provided by the first paragraph of 35 U.S.C. § 112, I acknowledge the duty to disclose information which is material to patentability as defined in 37 CFR § 1.56 which became available between the filing date of the prior application and the national or PCT International filing date of this application.

Application Serial No.	Filing Date	Status (pending, patented, abandoned)
PCT/SE99/01213	02 JULY 1999	

And we (I) hereby appoint: Norman F. Oblon, Reg. No. 24,618; Marvin J. Spivak, Reg. No. 24,913; C. Irvin McClelland, Reg. No. 21,124; Gregory J. Maier, Reg. No. 25,599; Arthur I. Neustadt, Reg. No. 24,854; Richard D. Kelly, Reg. No. 27,757; James D. Hamilton, Reg. No. 28,421; Eckhard H. Kuesters, Reg. No. 28,870; Robert T. Pous, Reg. No. 29,099; Charles L. Gholz, Reg. No. 26,395; William E. Beaumont, Reg. No. 30,996; Jean-Paul Lavalleye, Reg. No. 31,451; Stephen G. Baxter, Reg. No. 32,884; Richard L. Treanor, Reg. No. 36,379; Steven P. Weihrouch, Reg. No. 32,829; John T. Goolkasian, Reg. No. 26,142; Richard L. Chinn, Reg. No. 34,305; Steven E. Lipman, Reg. No. 30,011; Carl E. Schlier, Reg. No. 34,426; James J. Kulbaski, Reg. No. 34,648; Richard A. Neifeld, Reg. No. 35,299; J. Derek Mason, Reg. No. 35,270; Surinder Sachar, Reg. No. 34,423; Jeffrey B. McIntyre, Reg. No. 36,867; William T. Enos, Reg. No. 33,128; Michael E. McCabe, Jr., Reg. No. 37,182; Bradley D. Lytle, Reg. No. 40,073; and Michael R. Casey, Reg. No. 40,294; our (my) attorneys, with full powers of substitution and revocation, to prosecute this application and to transact all business in the Patent Office connected therewith; and we (I) hereby request that all correspondence regarding this application be sent to the firm of OBLON, SPIVAK, McCLELLAND, MAIER & NEUSTADT, P.C., whose Post Office Address is: Fourth Floor, 1755 Jefferson Davis Highway, Arlington, Virginia 22202.

We (I) declare that all statements made herein of our (my) own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

1-00 Per-Goran ANDERMO
NAME OF FIRST SOLE INVENTOR

Residence: Steijers vag 2, S-191 45
Sollentuna, SWEDEN SEX

✓ P G Andermo
Signature of Inventor

Citizen of: SWEDEN

Post Office Address:
SAME AS ABOVE

✓ 13 February 2001
Date

2nd Anders OSTERBERG ✓
NAME OF SECOND JOINT INVENTOR

✓ [signature]
Signature of Inventor

✓ 16 February 2001
Date

Residence: Forsvagen 92, S-187 64
Taby, SWEDEN SEX

Citizen of: SWEDEN ✓

Post Office Address: SAME AS ABOVE

NAME OF THIRD JOINT INVENTOR

Signature of Inventor

Date

Residence:

Citizen of:

Post Office Address:

NAME OF FOURTH JOINT INVENTOR

Signature of Inventor

Date

Residence:

Citizen of:

Post Office Address:

NAME OF FIFTH JOINT INVENTOR

Signature of Inventor

Date

Residence:

Citizen of:

Post Office Address: